Original Article

How prompt do patients receive orthopaedic care in tertiary health facilities in resource-constrained setting?

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Abstract

Background: The timeliness domain of quality plays prominent role in assessing the quality of emergency medical care and trauma care. Prompt services reduce morbidity, mortality, man-hour and resource wastages in the health system. Delays in accessing care are common in health facilities in most low- and middle-income countries.

Aim: To determine the waiting time before orthopaedic services were received at the various units by ambulatory adults at the University of Port Harcourt Teaching Hospital.

Methods: This time-flow study for receipt of orthopaedic services by ambulatory patients in the University of Port Harcourt Teaching Hospital used a longitudinal study design. Responses from consecutively sampled patients were analyzed using Statistical Package for Social Sciences (SPSS) version 23 for windows.

Results: A total of 442 patients gave consent and were recruited into the study but only 430 patients gave complete responses to the questionnaires giving a response rate of 97.3%. The mean age was 38.5 +/-14.8 years. The mean time from when a patient was referred to see the orthopaedic doctor to the commencement of orthopaedic consultation was 2.6 days; while that for receiving radiologic services after seeing the orthopaedic doctor was 1. 9 days. At the doctor's station, 50 % of patient waited for 33.34minutes before orthopaedic service was rendered. Visit status, gender and educational qualification showed strong association with waiting times at the records, nursing station and doctor's station respectively.

Conclusion: Waiting time is an important indicator to the quality of care received and reducing it is key to improving care quality.

Keywords: Timeliness, prompt services, health quality

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INTRODUCTION

The WHO defined quality as "the extent to which health care services provided to individuals and patient populations improve desired health outcomes.[1] It also defined six main dimensions of quality which include: (a) safety: the provision of health services with minimum risk and the absence of preventable injuries and medical errors to care recipients; (b) effectiveness: the provision of sound health services based on acceptable scientific evidence; (c) timeliness (acceptability): systemic attitude of avoiding delays in the provision of health services; (d) efficiency: avoidance of waste and the maximum utilization of available resources in the delivery of health services; (e) equity: health services delivered with no discrimination on the lines of recipients' race, gender, socio-economic status, geographic location, political affiliation, ethnicity and sexual orientation; and (f) people-centeredness: health services delivered with the core concerns, cultural inclinations and other peculiarities of the recipients in mind.[2]

The timeliness domain of quality plays prominent role in assessing the quality of emergency medical and trauma–related aspects of health care. It reduces morbidity, mortality and wastages in the health system.[3] The interval between presentation and intervention is a predictor of the quality of treatment outcome. Some authors [4,5] have found timeliness to care as the strongest indicator to overall patient satisfaction.

Delays in access to care are common in some health facilities. Merritt Hawkins & Associates[6] in a survey of Physician Appointment Wait Times across 15 major metropolitan centres found that delays of up to 2 weeks or more are quite common. Bureaucratic bottle necks, payment hurdles, system- related delays, delays in purchase of prescribed medications and equipment, delays in availability of a suitable care provider and delays in availability of theatre space may all contribute in prolonging the presentation-intervention interval in the developing world.

For elective visits, advanced access scheduling has been shown to improve access and patients satisfaction.[7] This model promotes elective scheduling of patients irrespective of the patient or physician perceived urgency. Both Conner-Spady et al[8] and Löfvendahl et al[9] in their studies on orthopaedic patients showed that dissatisfaction with care increase directly with waiting time for clinic visits and for scheduled surgeries.

The longer the period of delay, the poorer the outcome. This is truer in emergency care than in any other aspect of health care.[8,9] When disruptions of vital organs functions occur, quick interventions are the only acceptable path to good outcome. In middle and low income countries were insurance is still at unacceptably low levels, certain needed equipment are not available and available resources for emergency care are over-stretched, such delays exist and may play huge contribution to the higher mortality and poor treatment outcomes noticed.

Health systems with poor quality of care will consistently reduce the confidence of the population served on the health care services provided by the system, produce unsafe health care, reduce the quality of health of the population served and ultimately reduce the productivity of the population served. This study is aimed at determining the waiting time before orthopaedic services were received at the various units by ambulatory adults at the University of Port Harcourt Teaching Hospital.

METHODS

Study setting

The study was conducted among adult first time or repeat visitors to the orthopaedic clinics of the University of Port Harcourt Teaching Hospital (UPTH). The orthopedic clinic is one of 55 specialty clinics in the hospital and runs three days (Tuesdays, Wednesdays, and Thursdays) every week. The Orthopaedic department provides both out-patient and in-patient services in the hospital and is an accredited training centre for orthopaedic surgeons. From Figure 1, first-time and repeat visitors to the orthopaedic clinic are first seen at the medical records department where new

folders are opened for the first-time visitors and old case notes retrieved from the repeat visitors to the clinic. First timers to the orthopaedic clinic are first attended to by the various gatekeepers – family medicine (GOPC), Accident & Emergency (A&E), Children Emergency Ward (CHEW) or the Children Outpatient Clinic (CHOP) who provide first line care before patients are referred to the orthopaedic doctors. The ambulatory patients are first attended to by the nurses who observe their vital signs, do necessary documentation and sort out case files for the attention of the first line or orthopaedic surgeon. Patients' pathways post-consultation with the orthopaedic doctors are varied and could be to any of the following: radiology, laboratory, pharmacy, admission or follow up clinic visit.

Study design

This time-flow study for receipt of orthopaedic services by ambulatory patients in the University of Port Harcourt Teaching Hospital used a longitudinal study design.

Study population

Adult ambulatory patients who visited the orthopedics clinics at the University of Port Harcourt Teaching Hospital from March 2020 to June 2020. The study excluded critically ill patients and those who declined consent for participation.

Sampling method

Patients who meet the inclusion criteria were sampled at exit point using consecutive sampling method until the required sample size is reached.

Data collection

Study participants were recruited at the medical record stations of the hospital after verification of their primary condition warranting the visit. The study questionnaires were handed down the patients after full brief on recording time spent at each service station. The patients and their accompanying relatives were encouraged to consistently use the same timing device throughout the indexed visit. Those with poor literary skills were supported by the research assistants throughout the entire process. Three data collectors who were resident doctors in the department of orthopaedics were recruited, trained, and deployed for the data collection.

Study tool

The study tool included a structured self-administered questionnaire developed by the authors, a timesheet, and digital watches to record arrival at the department from all service points related to the patient visit to the for care at the orthopaedic clinic.

The face and content validation of the study instrument was conducted using subject experts and patients to improve it appropriateness, comprehensibility, and the suitability of the contents for orthopaedic patients. The internal consistency reliability of both tools was assessed using the Cronbach's alpha-coefficient while the validity was demonstrated by the item-response characteristics, item-total, and domain-total partial correlation.

Study variable

The independent variables in the study included patients' socio-demographic characteristics like age (measured on a continuous scale), gender, occupation was dichotomized into working (for the self-employed, civil servants and private-employed) and not working (for the unemployed, retired and students). Educational status was dichotomized into primary education (for the uneducated and patients with only primary level of education) and post primary education (for patients with secondary and tertiary level of education). Marital status was also dichotomized into married (for the married patient) and the not married for the unmarried and the divorced / widowed). The independent variable also includes profile of the hospital visits such as visit status and primary orthopaedic complaints. The dependent variable was the time spent at each service station during the visit to the hospital. Time spent was measured from the point when the patient arrived at the service station to the time when s/he concluded with the activities at that service station. This included the idle time (point of arrival at a service station to commencement of intended service at that station) and effective time (time spent receiving specific attention

from an appropriate healthcare provider at the service station).

Data analysis

The Statistical Package for Social Sciences (SPSS) version 23 for windows (International Business Machines Corporation, Armonk, New York, United States of America) was used in data analysis. Descriptive statistics on demographics and time spent were performed using frequencies, percentages, means, standard deviations and findings presented in tables and figures. The inferential statistics deployed in the analyses were the one-way Analysis of Variance (ANOVA) and the multivariate generalized linear regression since the outcome data was skewed. While the differential time spent for each case category was analysed using ANOVA, the predictors of waiting time were identified using the multivariate linear regression as the outcome or dependent variable (time spent) was measured on a continuous scale. The unstandardized regression coefficient along with the p-values were reported.

Ethical consideration

The entire research and the level of patients' involvement was be explained to the patient with the aim of seeking his/her voluntary consent with was be written and undersigned by the patient and his/her witness (a close family relative). Ethical approval was obtained from the Ethics Committee of University of Port Harcourt in line with Helsinki declaration. The hospital number of the patient was used, instead of the name, for data collection. Patients' right not to be included in this study, decline, or withdraw from it at any time, without any penalty was duly explained.

RESULTS

A total of 442 patients gave consent and were recruited into the study but only 430 patients gave complete responses to the questionnaires giving a response rate of 97.3%. Table 1 showed that the age range was 18-89 years while the mean age was 38.5 years with a standard deviation of +/- 14.8. The preponderance of the study population were females (55.8%), currently married (60.5%), employed (24.2%), had years of schooling beyond primary education (82.6%), were first time visitors (57.7%) and had bone fracture (28.4%) and joint pain (26.0%) as their primary orthopaedic complaints.

Table 2 shows the analysis of the time spent in the various care stations. The mean time it takes from when a patient is referred to see the orthopaedic doctor to the commencement of orthopaedic consultation was 2.6 days; while that for receiving radiologic services after seeing the orthopaedic doctor was 1. 9 days.

As shown in Table 3, there was significant variations in the time spent at the service stations by patients having varied orthopaedic complaints except for the receipt of services at the pharmacy ($F_{5, 424}$ = 1.07, p = 0.375). The least time spent at the stations were report by patients with primary orthopaedic complaints as fracture for the records unit (15.98 ± 7.83 minutes), for nursing station was joint pain (20.40 ± 7.69 minutes). Those with spinal cord injuries spent shorter time to receive general practice care (30.0 ± 15.6 minutes) and general laboratory services (41.50 ± 19.31). Those with limb swelling spent the least duration to seeing the orthopaedic doctors (1.87 ± 1.31 days), access radiological services (1.42 ± 0.72 days) and received attention at the pharmacy (69.03 ± 44.30 minutes).

Table 4 shows the time spent across service stations differentiated by patient categories. Females spend more time at record, nursing, first-contact doctor and pharmacy than males. Those in employments spend more time at record, first-contact doctor, laboratory than those not currently working. Patients with less education spend more time at record, first-contact doctor, orthopaedic doctor, radiology laboratory than more educated patients. Married patients spend less time only with the orthopaedic doctor and at the pharmacy than the currently single patient. Finally, first-time patient spent more time at record, first-contact physician, laboratory than repeat visitors.

Table 5 show the patient and visit-specific factors associated with the time spent at the various stations of care. Repeat visitors spend more than 2 minutes less at the record

Table 1: Background characteristics of study participants

Variables	Categories	Frequency	Percent
Gender	Male	190	44.2
	Female	240	55.8
Occupation	Unemployed	104	24.2
	Employed	326	75.8
Educational Status	<=Primary	75	17.4
	>Primary	355	82.6
Marital status	Currently single	170	39.5
	Currently married	260	60.5
Visit status	First time	248	57.7
	Subsequent	182	42.3
Primary orthopaedic Complain	Bone fracture	122	28.4
	Bone infection	43	10.0
	Limb swelling	31	7.2
	Back pain	85	19.8
	Joint pain	112	26.0
	Spinal cord problem	37	8.6
Age – mean (SD, min - max)		38.5 years (14.8, 18 – 89)	

station than first time visitors and this difference is statistically significant (p = 0.011). The reverse occurs with time spent to see the orthopaedic doctor. Male patients spend on the average, significantly less time at the nursing stations than female patients (B = -2.12, p = 0.003). Those who are not currently employed spend significantly less time at the nursing (B = -2.12, p = 0.029) but more time to see the first line doctor (B = 8.25 minutes, p = 0.002) and at the laboratory (B = 10.13 minutes, p <0.001). Higher level of education was associated with significantly less time spent to see the orthopaedic doctors (p<0.001).

DISCUSSION

This study evaluated over 430 completed responses from care recipients on the level of responsiveness of orthopaedic services in the University of Port Harcourt Teaching Hospital. Most of the patients were young (mean age, 38.52years, and median age: 36years), privately employed (34.9%, n=150) and were visiting the facility for the first time (57.7%, n=248).

Table 2: Time spent to receive various services

Service station	Unit	Time spent					SE
		Mean	Standard deviation	Minimum	Maximum	Skewness	
Medical record	Minutes	17.81	8.64	5	50	0.68	0.118
Nursing station	Minutes	27.70	7.93	10	40	0.49	0.118
General duty doctor	Minutes	33.34	21.15	10	60	1.78	0.118
Orthopaedic doctor	Days	2.60	1.64	1	12	1.43	0.118
Radio-imaging	Days	1.93	1.23	1	7	1.53	0.118
General laboratory	minutes	48.42	23.09	24	130	0.50	0.118
Pharmacy	Minutes	81.81	51.22	10	180	0.74	0.118

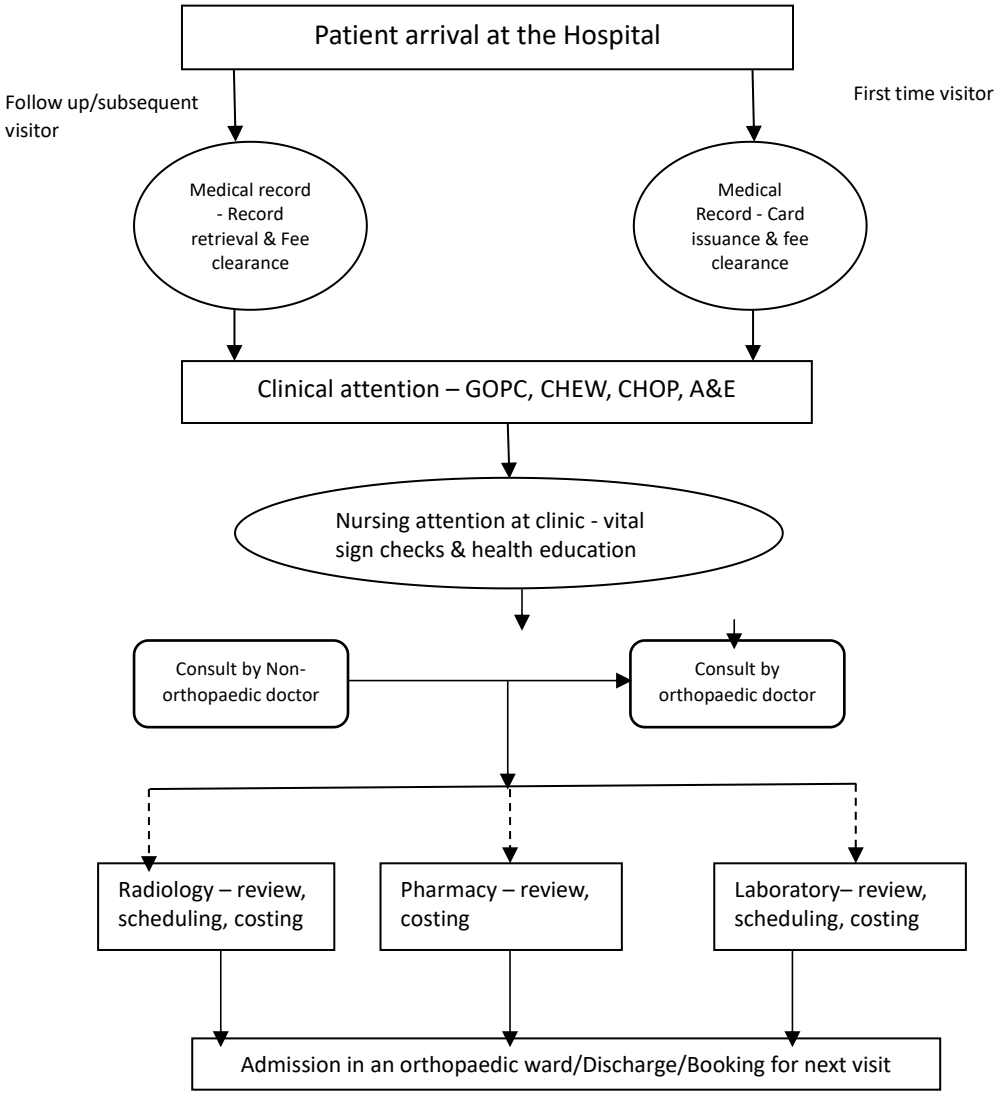

Figure 1: Patient flow for the receipt of orthopaedic services in a Teaching Hospital

Table 3: Time spent to receive different orthopaedic services

Orthopaedic Complaints	Time spent to receive services for various orthopaedic complaints – mean (SD)						
	Record Service (minutes)	**Nursing Service (minutes)**	**Dr. on duty Serv. (minutes)**	**Ortho. Dr. Serv. (days)**	**Radiology Serv. (days)**	**Laboratory Serv. (minutes)**	**Pharmacy Serv. (minutes)**
Bone fracture	15.98 (7.83)	20.49 (7.20)	31.97 (21.52)	2.51 (1.42)	1.64 (1.17)	44.66 (20.77)	78.57 (49.95)
Bone infection	18.14 (9.00)	21.74 (7.86)	37.91 (24.06)	2.05 (1.57)	1.72 (0.93)	51.07 (29.71)	78.60 (56.42)
Limb swelling	17.90 (8.24)	22.58 (8.84)	39.68 (26.89)	1.87 (1.31)	1.42 (0.72)	52.65 (26.60)	69.03 (44.30)
Back pain	16.35 (7.46)	22.71 (7.74)	30.82 (17.30)	2.79 (1.69)	2.35 (1.29)	52.80 (20.83)	81.59 (55.31)
Joint pain	19.87 (9.71)	20.40 (7.69)	34.33 (21.74)	3.00 (1.84)	2.18 (1.36)	49.29 (23.64)	89.82 (48.81)
Spinal cord	20.54 (8.64)	26.49 (8.89)	30.00 (15.59)	2.49 (1.54)	1.84 (1.09)	41.51 (19.31)	83.24 (51.52)
$ANOVA_{(df = 5, 424)}$	3.71	4.38	1.55	4.02	5.98	2.31	1.07
(p-value)	0.003	0.001	0.175	0.001	0.000	0.043	0.375

Table 4: Time spent at service stations across patient categories

Independent variable - ref	Waiting time for service stations - Mean ± SD						
	Record Unit Minutes	Nursing Unit Minutes	Dr. on duty Minutes	Ortho. Dr. Days	Radiology Days	Laboratory Minutes	Pharmacy Minutes
Gender –	18.2 ± 8.6	22.8 ± 7.9	34.9 ± 22.6	2.5 ± 1.8	1.8 ± 1.2	46.8 ± 22.5	82.6 ± 51.0
Female	17.1 ± 8.7	20.3 ± 7.7	31.4 ± 19.0	2.7 ± 1.5	2.0 ± 1.3	50.4 ± 23.7	80.8 ± 51.6
Male							
Work – Yes	18.3 ± 8.8	21.4 ± 7.5	34.9 ± 22.9	2.6 ± 1.5	1.9 ± 1.2	50.5 ± 24.2	80.1 ± 53.4
No	16.4 ± 7.9	22.7 ± 9.1	28.3 ± 13.2	2.7 ± 1.9	2.0 ± 1.3	41.8 ± 17.7	87.1 ± 43.4
Edu – Post-primary	17.7 ± 8.4	22.0 ± 8.1	33.1 ± 21.3	2.5 ± 1.4	1.9 ± 1.2	47.1 ± 23.1	84.5 ± 51.8
Primary	18.5 ± 9.9	20.1 ± 6.7	34.5 ± 20.5	3.3 ± 2.2	2.1 ± 1.2	54.5 ± 22.2	69.1 ± 46.8
Married – Yes	18.2 ± 8.9	22.0 ± 7.8	33.4 ± 21.4	2.5 ± 1.6	1.9 ± 1.2	48.7 ± 24.1	79.9 ± 50.1
No	17.2 ± 8.3	21.2 ± 8.1	33.2 ± 20.8	2.7 ± 1.8	1.9 ± 1.3	48.0 ± 21.4	84.7 ± 52.9
Visit – Repeat	16.7 ± 7.6	22.6 ± 8.8	31.9 ± 21.2	2.9 ± 1.8	2.0 ± 1.1	47.1 ± 22.9	83.5 ± 49.0
First time	18.6 ± 9.2	21.1 ± 7.2	34.4 ± 21.1	2.4 ± 1.4	1.9 ± 1.3	49.4 ± 23.2	80.6 ± 52.8

Table 5: Factors associated with waiting time for receipt of various services – generalized linear model

Independent variable - ref	Waiting time for services relating to…						
	Record Unit B (p-value)	Nursing Unit B (p-value)	Dr. on duty B (p-value)	Ortho. Dr. B (p-value)	Radiology B (p-value)	Laboratory B (p-value)	Pharmacy B (p-value)
Age	-0.01 (0.965)	0.02 (0.555)	0.53 (0.479)	0.00 (0.643)	0.13 (0.004)	-0.01 (0.904)	-0.36 (0.481)
Gender –	-	-	-	-	-	-	-
Female	-1.49 (0.078)	-2.29 (0.003)	-3.65 (0.770)	-0.13 (0.406)	0.20 (0.106)	3.11 (0.165)	-2.49 (0.619)
Male							
Work – Yes	-	-	-	-	-	-	-
No	1.91 (0.057)	-2.12 (0.029)	8.25 (0.002)	0.20 (0.317)	0.12 (0.442)	10.13 (0.000)	-5.18 (0.414)
Edu – Primary	-	-	-	-	-	-	-
Post-primary	-0.77 (0.482)	1.51 (0.130)	-0.98 (0.713)	-0.87 (0.000)	0.16 (0.319)	-6.44 (0.27)	14.805 (0.23)
Married – No	-	-	-	-	-	-	-
Yes	0.40 (0.672)	1.11 (0.200)	-3.00 (0.198)	0.13 (0.461)	0.01 (0.967)	-2.09 (0.407)	-1.60 (0.778)
Visit – First	-	-	-	-	-	-	-
Repeat	-2.26 (0.011)	1.27 (0.115)	-3.94 (0.069)	0.51 (0.002)	0.04 (0.726)	-2.81 (0.231)	6.42 (0.223)

The mean age of 38.5years clearly reflects the predominantly youthful national demographic indices. This finding is similar to findings in a similar study by O'Malley et al.[10] The predominant female sex distribution may result from a better health–seeking behaviors than males.[11]

The mean time it takes from when a patient is referred to see the orthopaedic doctor to the commencement of orthopaedic consultation was 2.6 days. Over half a century ago, Rossitter and Raynolds [12] defined waiting time as the time a patient waits in the clinic before being seen by one of the clinic medical staff.

This has been widely seen as an important indicator to the quality of care received in a center and a predictor to the patients' level of satisfaction and his/her willingness to utilize health services in a given facility.[13]

The waiting time to see the genaral doctors for an orthopedic complain from this study was 33.34minutes. This fell below the recommendation by the institute of Medicine (IOM) that 90% of patients should be seen within 30 minutes of their scheduled appointment.[10] Most studies in developing world report an average waiting time of 120-240 minutes.[14-16]. Oche and Adamu in a similar study in Sokoto, showed a mean waiting period of 83.7 minutes[17] while Mazaheri et al.,[18] in Iran found a mean clinic waiting time of 64.2 minutes. The shorter waiting time in this study can be attributed to the fact that patients from the Accident and Emergency unit who form the larger proportion of patients will have a shorter waiting time since emergency treatment was needed for such patients.

Since patients have the waiting experience before having the opportunity to assess the physician's technical and interpersonal skill, it may mold the patients' early perception of the health facility and influence his/her level of utilization of the facility. Steps geared towards reducing the waiting time will therefore improve care quality and service utilization, hence increasing the demand end of health services.

The mean time to see the specialist doctor in this study however was 2.5days. This time was measured from when the patient was referred to see the specialist doctor to when the patient eventually sees the doctor. The three-day per week clinic schedule in the study area and the rather long clinic waiting list may have contributed to this finding.

Patients with certain orthopaedic conditions like fractures had the least waiting time. This further portrays the fact that perceived orthopaedic emergencies had lower waiting times compared to other conditions.

Visit status, gender and educational qualification showed strong association with waiting times at the records, nursing station and doctors station respectively. The reason for such predictive influences are not clear. Several other authors[19-21] have also shown influence from demographic variations and visit status. The familiarity of repeat visitors to their physician, cultural regard for specific gender and the need to reduce productive man-hours by seeing employed patients first are some reasons alluded for the observed finding.

Egdman-Levithan et al[22] have found that reducing wait times within primary care for both urgent and routine care, if given considerable attention with practical guides can remarkably improve the quality of care and raising quality ratings patients irrespective of sociodemographic and other variables.

Other authors[23-25] have given some recommendations on improving waiting time such as visit scheduling, minimizing the number of patients scheduled to see one specialist per clinic day, setting up walk-in services, using midlevel providers to provide coverage as well as removing systemic bottle necks at the support stations. Health system managers in low and middle income countries need to adopt such measures aimed at reducing waiting time and improving care quality.

CONCLUSION

Waiting time is an important indicator to the quality of care received in a center and a predictor to the patients' level of satisfaction and his/her willingness to utilize health services in a given facility. Patient's visit status, gender and educational qualification show close association with waiting times at the records, nursing station and doctor's station respectively. The findings from this study can assist health policy makers in formulating efforts aimed at improving care quality.

Limitation of this study

The study was conducted over a period of four months limiting the number of patients enrolled into the study. Also severely ill and non-ambulatory patients who typically spend more time in the hospital were excluded from the study. Their perceptions on timeliness of services may offer a different perspective to the discussion.

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Conflicts of interest

There are no conflicts of interest.

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